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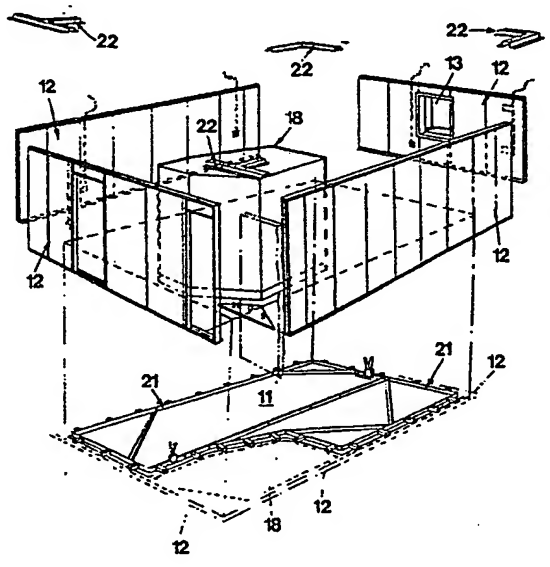
With international search report.

(54) Title: A ROOM ELEMENT, PARTICULARLY A CABIN OR A BERTH IN A SHIP

(57) Abstract

A room element, particularly a cabin or a berth arranged in a supporting framework, such as a ship or the like, which room element is connected to a heating and ventilation system, and is supplied with heat, ventilation, electric current and the like from central supply mains arranged outside the room element, whereby the site-built room element comprises a number of pre-fabricated, self-supporting wall members (12), which at the lower part are attached to the sub floor/deck (11), via side flanges (20) extending from the members, said wall elements (12) in the upper part being interconnected by means of groove-formed connecting sections (22) designed straight, L- or T-shaped and intended to enclose the upper part of the wall elements for keeping the separate members together in the longitudinal direction of the walls and also at corner and wall connections, the roof of the room element being divided into at least three sections, where the middle section and every second section, respectively, are beams (27) extending from one wall element (12) to another, which beam (27) is designed on one hand as a support for ribbed plate ceilings (26) arranged transversely to the beam, and having their opposite ends supported on said connecting sections (22), and on the other hand as carriers for supply means (29) for the room element, such as channels (30), conduits (35), tubes (33) and the like.



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A ROOM ELEMENT, PARTICULARLY A CABIN OR A BERTH IN A SHIP

The present invention relates to a room element, particularly a cabin or a berth arranged in a supporting framework such as a ship or the like, which room element is connected to a heating and ventilation system, and is supplied with heath, ventilation, electric current and the like from central supply mains arranged outside the room element, whereby the site-built room element comprises a number of pre-fabricated self-supporting wall members, which at the lower part are attached to the sub floor/deck via side flanges extending from the members.

BACKGROUND OF THE INVENTION

Passenger and crew cabines in ships nowadays often are module adapted, which is a prerequisite for a rational production and for having the possibility to use prefabricated room elements. The most common type of prefabricated room elements, which have been used hitherto, are so called volume units, i.e. containers, comprising a complete cabin with shower and toilet room, and which volume unit has walls and roof, and with or without a floor. Such a construction requires a very high deck level and is, because of its volume and weight, very difficult to handle in narrow decks and they therefore commonly have to be mounted during building of the ship's hull. During this stage of building, the volume units however are obstructing the work. The volume units during their period of assembly, furthermore are exposed to mechanical damage and weather and winds and therefore have to be protected in a proper way. The volume units furthermore have to be dimensioned thus that they can be transported in a safe way without damages. This results in a higher weight per unit, which means that the volume units will be more expensive than rooms which are site-builded in spite of the time saved during assembly.

Hitherto known site-built room elements must have attachments

for the wall members welded to the upper and the lower decks, and the roof of the room element is hung like a false ceiling in the upper deck. Usually, the room elements are built like frameworks, which frames are insulated and filled by panels, but also prefabricated wall elements can occur. This building method requires a lot of work and time. Furthermore, the wire laying for heat, water, ventilation, electricity, telephone etcetera, remains.

OBJECT AND MOST ESSENTIAL FEATURE OF THE INVENTION

The object of the present invention is to provide a room element, which can make use of the advantages gained with known systems, i.e. prefabricated elements and the volume units, but which does not show their disadvantages. The room elements thus shall be possible to be built from prefabricated members, which are easy to handle and assemble, which room elements shall be selfsupporting relative to the upper deck of the ship, the bulkheads, shall plating, etcetera, and they shall be designed and adapted thus that the supply means for the media necessary for the room elements are included in the members. This has been obtained thereby that the wall elements in the upper part are interconnected by means of groove-formed connecting sections designed straight, L- or T-shaped and intended to enclose the upper part of the wall elements for keeping the separate members together in the longitudinal direction of the walls and also at corner and wall connections, that the roof of the room element is divided into at least three sections, where the middle section and every second section, repectively, are beams extending from one wall element to another, which beam is designed on one hand as a support for ribbed plate ceilings arranged transversely to the beam, and having their opposite ends supported on said connecting sections, and on the other hand as carriers for supply means for the room element, such as channels, conduits, tubes and the like.

DESCRIPTIONS OF THE DRAWINGS

The invention hereinafter will be further described as an embodiment with reference to the accompanying drawings.

Figure 1 shows a planar view of two room elements positioned next to each other, for example meant as crew cabins.
Figre 2 shows an exploded view in perspective of the left room element of figure 1.
Figure 3 shows in enlarged scale a section through a wall element.
Figure 3a is a section through a part of a wall element, like the one in figure 3 but thinner, the construction e.g. being intended for partition walls.
Figure 4 shows a planar view of a roof beam included in the room element according to the invention.
Figure 5 is a section along line V-V in figure 4.
Figure 6 is a section along line VI-VI in figure 4.
Figures 7 and 8 show in perspective connecting sections for connection of the corners of the wall elements.

DESCRIPTION OF THE EMBODIMENTS

The room element according to the invention is intended to be mounted directly on the floor or the deck 11 of a ship. The room element is made of prefabricated self-supported wall elements 12, with or without built-in conduits, two wall elements of which are partition walls between adjacent rooms, one is provided with a window opening 13 intended to be connected to the valve 15 of the outside planking 14, while the opposite wall element is provided with a door 16 which leads to a corridor 17. In the embodiment shown in figures 1 and 2, the shower and toilet room is made as a volume unit, which because of its small size can be easily monted in place. It is however also possible to let the shower and toilet room be included in the wall system of the room.

The wall elements, which are of conventional construction, as shown in figure 3, in their lower part are provided with a

bottom profile 19 designed with a flange 20 extending transversely to the wall, which flange can be attached to the deck 11, e.g. by screws. In order to facilitate a correct positioning of the wall elements 12, a fixture 21 is placed on the deck 11, the outside of which serves as a support when mounting the wall elements 12. As these are entirely self-supporting, i.e. they have no connections to the deck construction positioned above or to the outside planking, the necessary staying is provided between the walls by connecting profiles 22 placed on the upper free horizontal end parts, which connecting profiles 23,24 are L- or T-formed as shown in figure 7 and 8, except in the corners of the wall element where the profiles are straight. These connecting profiles 22, also called hat profiles, are screwed or riveted onto the wall elements, and they are designed with side flanges 25, which support the ribbed plate ceilings 26. Depending on the width of the room element, the ceiling is divided into three or more sections extending over the total lenght of the room, where the middle section and every second section respectively, are formed by a beam 27, while the side sections are formed by said ribbed plate ceiling 26.

The beam 27, which extends from wall element 12 to wall element 12 and is supported on these, is formed like a modified cable ladder, which consists of ladder steps 43 arranged between stringers 42, and in parallel to the stringers and spaced from these there are attached reinforcing rods 44. The ladder steps are formed as supports for all the supply means 29 required to serve the room. At the side of the stringers turned from the reinforcing rods 44 are arranged cross bars 45, to which are attached a ceiling covering 28, which can be of the same type as the ribbed plate ceilings 26.

Figure 3 shows a wall, which has many layers of insulation, which makes it suitable as an external wall, whereas figure 3a shows the upper part of a corresponding wall with only one insulating layer.

As shown in figures 4-6, upon the beam 27 there is arranged an

air escape 30 for supply air and an air treatment device 31 comprising air traps and supply air terminal devices 32, which lastmentioned are arranged on and opens at the lower side of the beam. Furthermore, the beam supports a tube arrangement 33 for the sprinkler system of the ship, with sprinkler nozzles 34, also arranged on the lower side of the beam. Furthermore, on the beam is placed conduits for electric current, for loudspeakers, for common aerials, for telephone, etcetera. Also the armatures 36 and 37 for lighting of the room element are mounted in the beam 27 and inserted in the ribbed plate ceilings 28. All supply means 29 are provided with connecting members at the end of the beam, in such a way that they can be easily connected to the supply mains in the roof of the adjacent corridor 17 and to connecting lines to outlets or the like in the wall elements. While the supply of heat, ventilation, current, etcetera to the rooms is substantially brought about horizontally, the supply tubes 38 for water and sewer are arranged vertically in a shaft 39, which via a door 40 is easily accessible from the corridor 17.

After mounting of the walls and the roof which in principle can be complete, the floor 41 remains, which for example can be made of a usual deck or cast compound and which also hides the flange 20 of the wall element.

Because of the fact that most of the supply means of the room and the armatures which belong thereto are supported by and fixed to the roof of the room, and not in any way are connected to the deck construction of the ship, the time needed for mounting a room element is very short, and the separate members and the beam can be easily transported and mounted by a few persons. This building principle has reduced the price for every room element very much, without reducing the quality and comfort and with maintained or even better possibilities for treatment.

CLAIMS

1. A room element, particularly a cabin or a berth arranged in a supporting framework such as a ship or the like, which room element is connected to a heating and ventilation system, and is supplied with heath, ventilation, electric current and the like from central supply mains arranged outside the room element, whereby the site-built room element comprises a number of pre-fabricated, self-supporting wall members (12), which at the lower part are attached to the sub floor/deck (11), via side flanges (20) extending from the members,
c h a r a c t e r i z e d t h e r e i n ,
that the wall elements (12) in the upper part are interconnected by means of groove-formed connecting sections (22) designed straight, L- or T-shaped and intended to enclose the upper part of the wall elements for keeping the separate members together in the longitudinal direction of the walls and also at corner and wall connections, that the roof of the room element is divided into at least three sections, where the middle section and every second section, repectively, are beams (27) extending from one wall element (12) to another, which beam (27) is designed on one hand as a support for ribbed plate ceilings (26) arranged transversely to the beam, and having their opposite ends supported on said connecting sections (22), and on the other hand as carriers for supply means (29) for the room element, such as channels (30), conduits (35), tubes (33) and the like.

2. A room element according to claim 1,
c h a r a c t e r i z e d t h e r e i n ,
that the beam (27), the supply means (29) and armatures connected thereto, for example supply air terminal devices and/or exhaust air terminal devices (32), light fittings (36,37), sprinkler nozzles (34) etcetera, are all formed in a prefabricated unit, ready for connection.

3. A room element according to claim 1 or 2, c h a r a c t e r i z e d t h e r e i n , that the beam (27) is formed by a cable ladder, consisting of ladder steps (43) arranged between stringers (43), reinforcing rods (44) being arranged in parallel with and attached to the stringers and spaced from these, the ladder steps being formed as supports for all the supply means (29), and cross bars (45) being arranged at the side of the stringers turned from the reinforcing rods, to which cross bars is attached a ceiling covering (28).

FIG 1

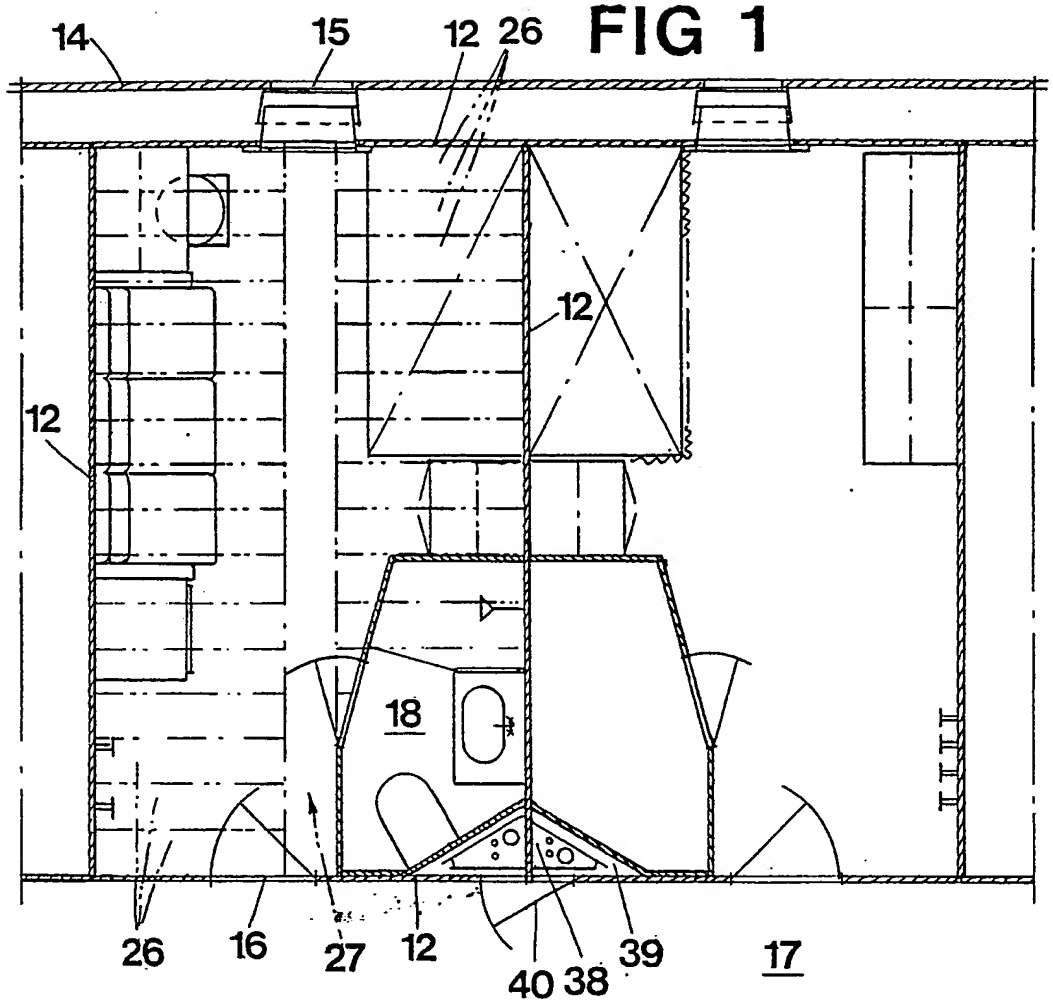

FIG 3a

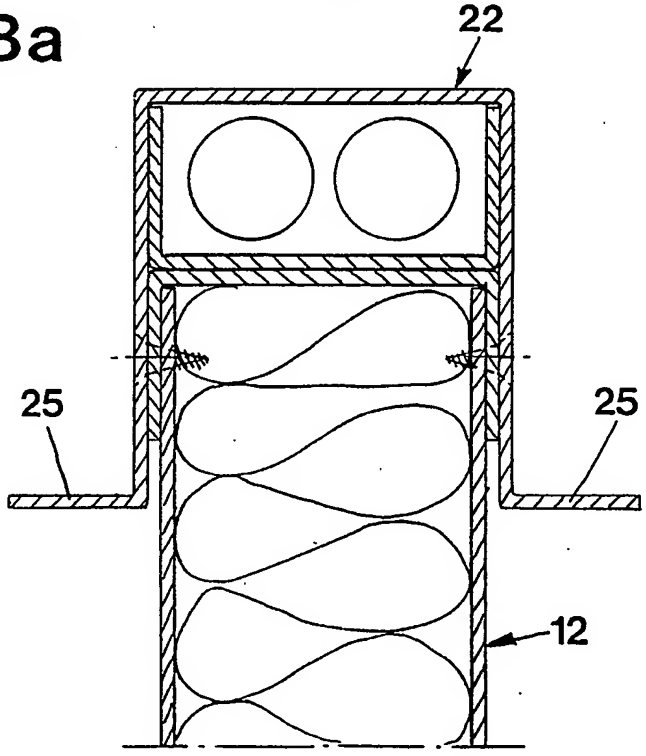

FIG 2

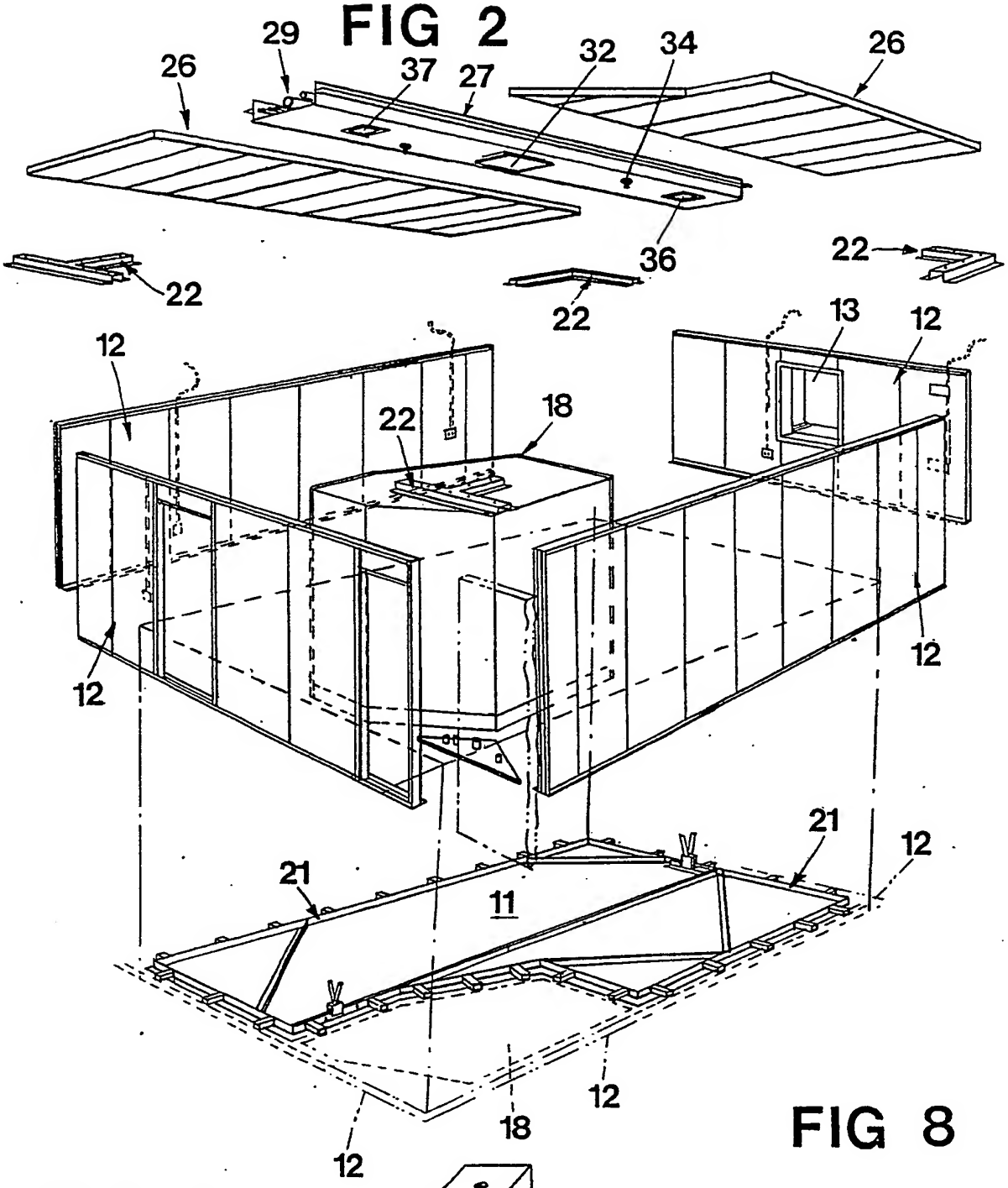

FIG 8

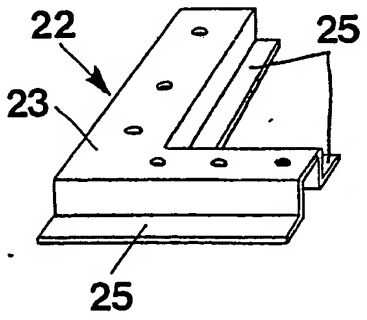

FIG 7

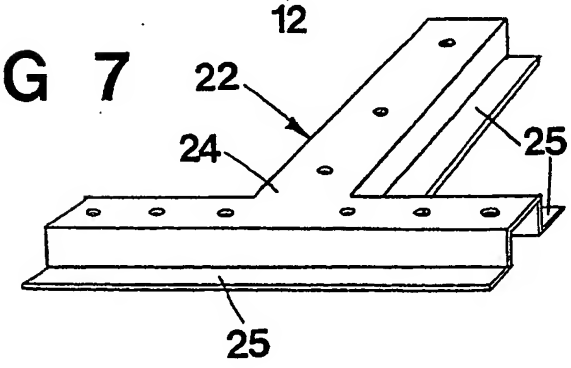

FIG 6

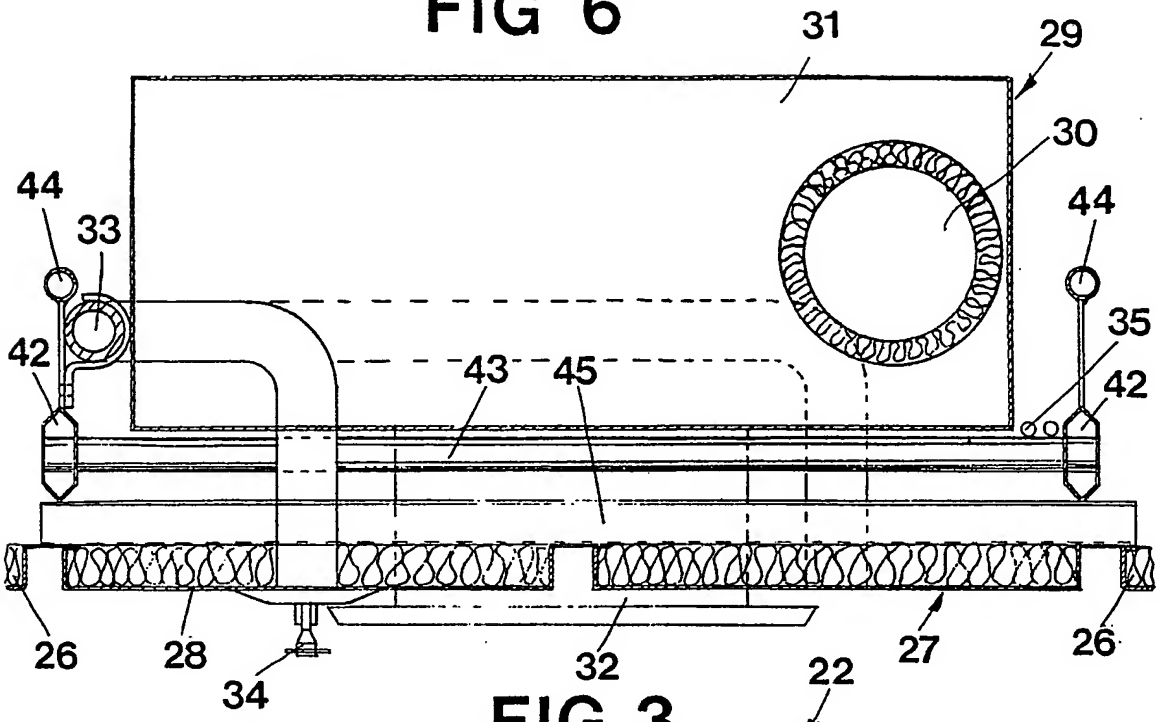
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FIG 3

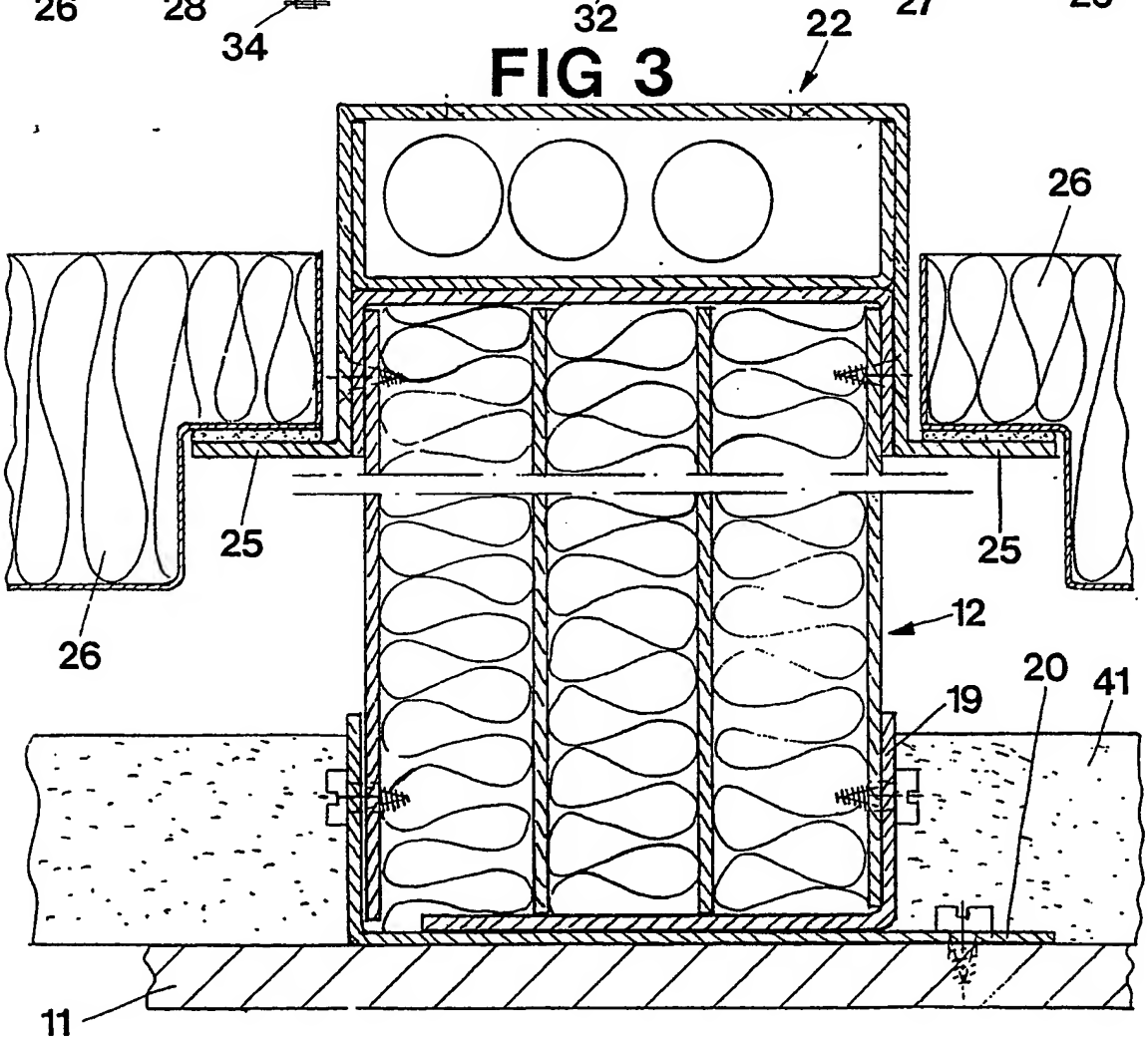
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FIG 4

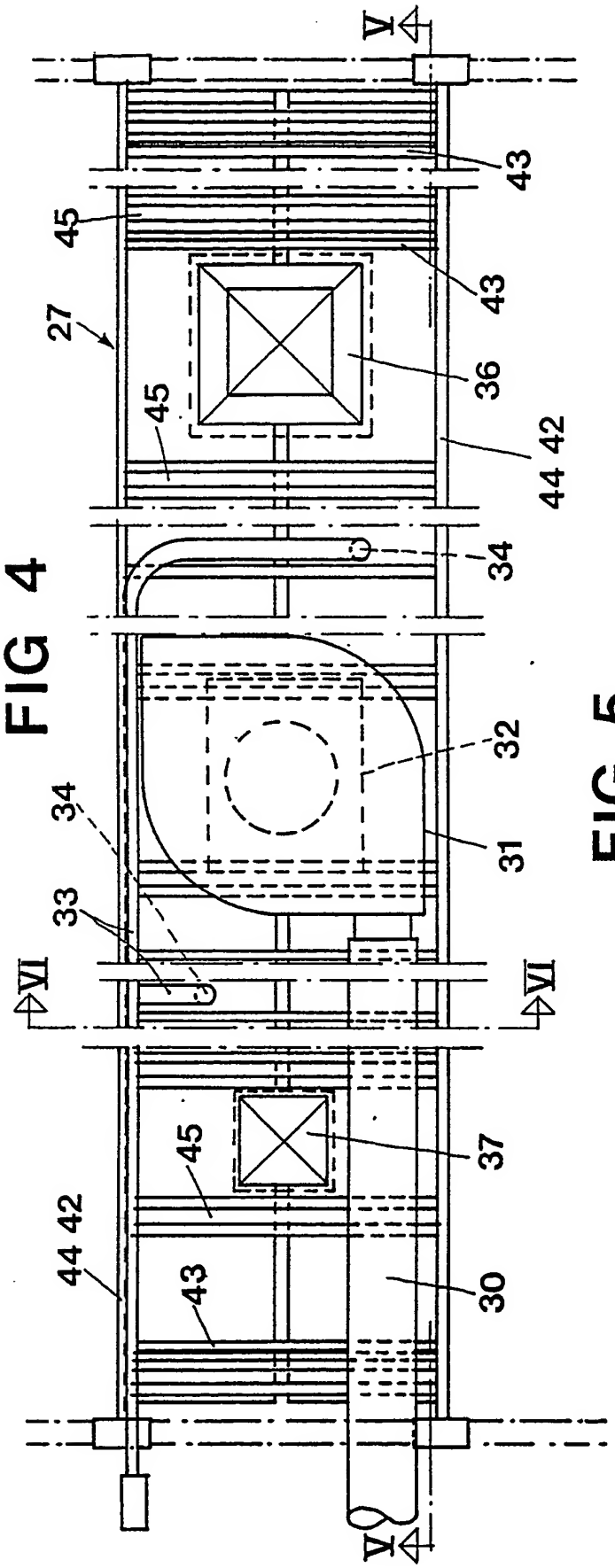
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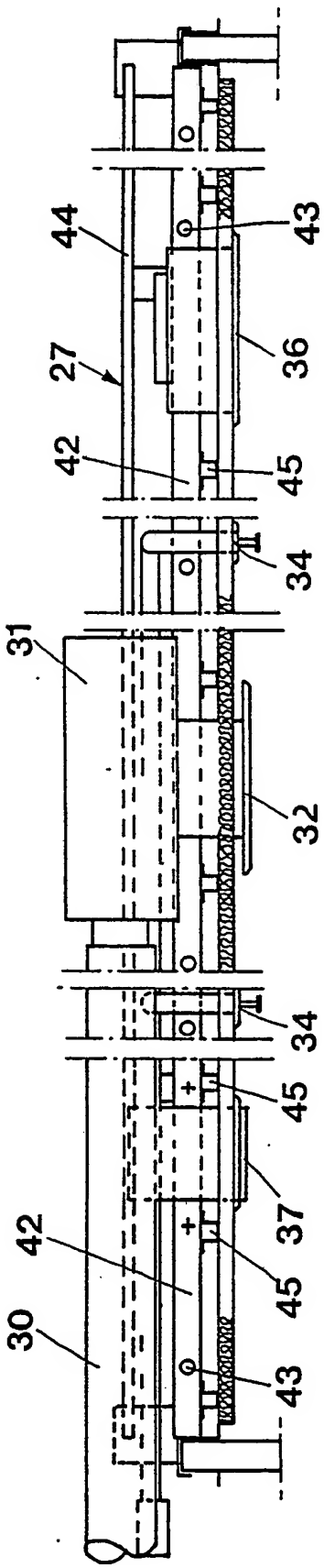
FIG 5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INTERNATIONAL SEARCH REPORT

International Application No PCT/SE86/00186

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) [6]

According to International Patent Classification (IPC) or to both National Classification and IPC

B 63 B 29/02, E 04 B 1/348

II. FIELDS SEARCHED

Minimum Documentation Searched [7]

Classification System	Classification Symbols
IPC 2,3,4	B 63 B 29/00, /02, 3/68; E 04 B 1/18, /348, /60, 5/52, 2/72
Nat Cl	65a1:16

Documentation Searched other than Minimum Documentation to the Extent that such Documents are included in the Fields Searched [8]

SE, NO, DK, FI classes as above

III. DOCUMENTS CONSIDERED TO BE RELEVANT [9]

Category [10]	Citation of Document, [11] with indication, where appropriate, of the relevant passages [12]	Relevant to Claim No. [13]
A	SE, B, 430 266 (GÖTAVERKEN MODUL AB) 21 October 1983	1
A	GB, A, 2 088 292 (OY WARTSILÄ AB) 9 June 1982	1
Y	SE, C, 370 746 (GULLFIBER AB) 28 October 1974	1
Y	SE, B, 417 625 (SVENSKA FLÄKTFABRIKEN AB) 30 March 1981	1
Y	SE, B, 429 353 (E. MUNK) 29 August 1983 & BE, 830048 NL, 7506228 FR, 2273916 DE, 2427997 AU, 81809/75 CA, 1016719 GB, 1495205 US, 4065898 AT, 343325	1

* Special categories of cited documents: [10]

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"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

IV. CERTIFICATION

Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report
1986-06-25	1986 -06- 30
International Searching Authority	**Signature of Authorized Officer**
Swedish Patent Office	Christer Jönsson

L.E

Form PCT/ISA/210 (second sheet) (January 1985)

BAD ORIGINAL

FURTHER INFORMATION CONTINUED FROM THE SECOND SHEET

II Fields Searched (cont).

US Cl 52:79.1, 282, 396

V. ☐ OBSERVATIONS WHERE CERTAIN CLAIMS WERE FOUND UNSEARCHABLE [1]

This international search report has not been established in respect of certain claims under Article 17(2) (a) for the following reasons:

1. ☐ Claim numbers ....., because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claim numbers ....., because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. ☐ Claim numbers ....., because they are dependent claims and are not drafted in accordance with the second and third sentences of PCT Rule 6.4(a).

VI. ☐ OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING [2]

This International Searching Authority found multiple inventions in this international application as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims of the international application.

2. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims of the international application for which fees were paid, specifically claims:

3. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claim numbers:

4. ☐ As all searchable claims could be searched without effort justifying an additional fee, the International Searching Authority did not invite payment of any additional fee.

Remark on Protest

☐ The additional search fees were accompanied by applicant's protest.

☐ No protest accompanied the payment of additional search fees.

III. DOCUMENTS CONSIDERED TO BE RELEVANT (CONTINUED FROM THE SECOND SHEET)

Category *	Citation of Document, with indication, where appropriate, of the relevant passages	Relevant to Claim No
	JP, 51007718 SE, 7505229	
Y	DE, B2, 1 937 443 (H.J. FISHER) 11 February 1971	1
Y	GB, A, 2 016 057 (P. DEPONDT ET AL) 19 September 1979 & FR, 2416982 US, 4245447	1
Y	EP, A1, 26 936 (Z. ANOSOWICZ ET AL) 15 August 1981	1
Y X A	CA, A, 1 067 665 (A. GARDNER) 11 December 1979 & US, 4540847	1 2 3
Y X A	SE, B, 382 838 (AS NORSKE VIFTEFABRIKK) 16 February 1976 & NL, 7001991 DE, 2006479 FR, 2035336 CH, 510184 US, 3655961 GB, 1292221 BE, 745876 AT, 304028	1 2 3
Y X A	SE, B, 383 372 (AS NORSKE VIFTEFABRIKK) 8 March 1976 & NL, 7102457 FR, 2081677 DE, 2109329 CH, 527338 US, 3687056 GB, 1321725 AT, 306983 BE, 763145	1 2 3
Y X A	CH, C, 548 680 (MILTON LIBERMAN) 3 April 1974 & NL, 7112075 FR, 2106400 DE, 214227 US, 3683101 GB, 1372193 .../...	1 2 3

III. DOCUMENTS CONSIDERED TO BE RELEVANT (CONTINUED FROM THE SECOND SHEET)

Category *	Citation of Document, with indication, where appropriate, of the relevant passages	Relevant to Claim No
	AT, 320783 AU, 31099/71 AT, 325272 AT, 329825 CA, 989327 DE, 2166970 AT, 337421 BE, 772391 CA, 1028964 JP, 51106097 SE, 384303	
X	SE, B, 414 694 (AUTOPUK OY) 11 August 1980 & SE, 7710079	3
X	FI, B, 67 160 (OY NOKIA AB) 28 September 1984	3